

## NEEDLELESS DRUG INJECTION DEVICE

## ABSTRACT OF THE DISCLOSURE

A drug injector includes a chamber for holding a drug to be injected into a biological body, and an nozzle through which the drug is injected. A piston is  
5 positioned in the chamber, and an actuator is coupled to the piston. The actuator includes a member that contracts when heated. In some embodiments, heating of the member is induced by applying a potential to the member. The actuator moves the piston towards the nozzle when the member is heated to expel the drug out of the chamber through the nozzle. The drug injector can include a sensor for measuring  
10 properties, such as stiffness, of the outer layer of the body. Further, the drug injector can adjust the piston movement based on the sensed properties. Alternatively, the sensor can be used with other medical devices, such as microneedle transport devices.